The Associations of Race with Health Status in the Family Practice Setting of North Carolina

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Abstract

Context: Minority race and ethnicity are associated with poorer health and shortened survival and there are well-documented disparities in the quality of health care that African Americans receive compared to Whites. However, there is little research that looks at disparities in health among family practice patients.

Objective: The aim of this cross sectional study is to identify differences in health-related quality of life, health risk factors, and chronic diseases between African American and White patients of family physicians in North Carolina.

Methods: Data for this study comes from the North Carolina Health Project (NCHP), a family practice network and research database of family practices in North Carolina. A four-page self- administered questionnaire that included sociodemographic data, health risk factors, chronic conditions, and health-related quality of life measures was completed by 4381 African American and White respondents.

Results: Obesity, insufficient exercise, high blood pressure, and diabetes were all found to be more likely to be reported by African Americans than by Whites in our population adjusted for age, gender and education level. African Americans also reported poorer health-related quality of life.

Conclusion: This study compliments previous evidence of racial disparities in chronic disease and health risk factors between African Americans and Whites, and it highlights specific factors that may be focused on in the family practice setting. Many risk behaviors associated with chronic disease are modifiable, and

counseling for behavior change in primary care has proven to be effective. These data provide evidence that family medicine clinicians should focus on culturally sensitive behavioral interventions and prevention techniques to reduce health disparities.

Introduction

In the recent literature there has been a lot of interest in health disparities, especially related to race. Minority race and ethnicity are associated with poorer health and shortened survival, and the process and delivery of health care contribute to disparities in health outcomes.[1,2] Membership in a minority racial/ethnic group has been shown to be a risk factor for lower quality and less intensive care.[3] Among the best-documented disparities in the quality of care that African Americans receive compared to Whites are those in the area of cardiology. There is strong evidence that revascularization procedures may be underused in treating blacks with coronary disease--a difference that cannot be explained by the clinical features of their disease.[4] Elderly blacks also receive less appropriate preventive care, including mammography and vaccinations.[5] Studies have shown that middle-aged (45-64) African American women are at greater risk of developing Type 2 diabetes, with almost 50% of the excess risk possibly related to modifiable risk factors.[6]

Studies suggest several possible explanations for disparities in health. These include: socioeconomic status (SES), access, health related behavior, discrimination, and racism. Race and ethnicity are important determinants of health in the United States, whether they represent actual differences or a constellation of factors that affect health and health status. It has been shown that blacks have disproportionate health problems as demonstrated by a higher prevalence of many risk factors, associated illnesses, and levels of comorbidity.[7]

However, they historically receive less medical care, and disparities in health exist on the bases of race and ethnicity even when problems of access and other SES conditions are factored out.[8]

Family practice physicians care for a population of adults with a high prevalence of chronic conditions and impairments. It is well known that lifestyle behaviors can contribute to chronic disease, and overall information about health behaviors in minority groups is insufficient. The family practice office constitutes an important site for intervention and public health messages. A recent study showed no evidence of lower levels of preventive care in black patients compared to white patients in primary care practices.[9] However, in the population as a whole, blacks receive less preventive care. Currently, no research has been reported that describes differences by race among patients with access to family practice care in North Carolina.

The aim of this cross sectional study is to identify differences in health-related quality of life, health risk factors, and chronic diseases between African American and White patients in family practices in North Carolina. There is some evidence to show that African Americans get sicker at an earlier age, and we will also explore the differences in the distribution of disease among age categories between African Americans and Whites. We are interested in the cultural and societal implications of race and its consequences in health care particularly as they pertain to primary care practice and cause of disparities. This study provides descriptive data for use by clinicians in family practice settings and will assist

them in focusing their clinical encounters and interventions on the greatest causes of health disparities and in working to close the gap.

Methods

Study Population:

Data for this study comes from the North Carolina Health Project (NCHP), a family practice network and research database of family practices in North Carolina sponsored by the UNC Center for Health Promotion and Disease Prevention, the UNC Department of Family Medicine, and the UNC Thurston Arthritis Research Center, in collaboration with the North Carolina Academy of Family Physicians. Data were collected in 2001 from a cohort of over 4,000 community-based patients from fifteen sites, representing twelve practices. The practices included in this project represent three geographic areas of North Carolina (west, central, and east), rural and urban locations within these areas, and a selection of practices with a high proportion of minorities.

For the development of the NCHP, potential sites were identified by a statewide survey of North Carolina Academy of Family Practice membership and from recommendations of Family Practice Department faculty based in Wilmington, Chapel Hill, Greensboro, Charlotte, and Asheville. Each identified practice was telephoned to obtain contact information, to identify the county in which the practice was located, to estimate the daily patient volume and to estimate the percentage of patients who are racial and ethnic minorities. Practices that could not be contacted were deleted from the list, yielding 28 sites eligible for selection.

The 28 eligible practices were divided into six strata by location in the state (west/central/east) and rural/urban status. Within each stratum, all practices reporting less than 40% of their visits from racial/ethnic minorities were highlighted, and the seven practices with high reported ethnic/minority populations were selected for recruitment. Then, one practice from each of the six strata was randomly selected (using a random numbers table). Following selection, all practices received a recruitment site visit by one of the principal investigators to explain the study.

Research assistants were hired for all sites. The research assistants were responsible for handing out questionnaires (see explanation below), answering participants' questions, assisting participants of low literacy levels with questionnaire completion, and performing other similar tasks.

Completed and incomplete questionnaires were mailed to UNC on a weekly basis, and three assistants entered all data into an Access database. Random checks were conducted of the data entry process to ensure accuracy, and data were cleaned and converted to SAS files for analysis.

The designation of rural or urban was based on the USDA rural-urban continuum codes for the county in which the practice was located.[10]

Study Questionnaire:

Data for this study came from a four-page, self-administered questionnaire. Respondents completed the questionnaire in their health provider's

office at the time of their visit, and the following measures were obtained for use in this study:

- **Sociodemographic data** were collected, including age, race, gender, weight, height, marital status, working status, and education level.
- **Health related quality of life** was evaluated, using the SF-12 and Behavioral Risk Factor Surveillance System (BRFSS) study instrument.
- **Risk behaviors** were noted, including little or no exercise on a usual day and current smoking status.
- **Chronic health conditions** were assessed, using a modification of the American Academy of Orthopedic Surgeons (AAOS) Musculoskeletal Outcomes Data Evaluation and Management System comorbidity form. (A list of common health problems including heart disease, high blood pressure, lung disease, stroke, osteoarthritis, ulcer/stomach disease, kidney disease, liver disease, cancer, depression, anemia, chronic back pain, chronic shoulder/neck pain, rheumatoid arthritis, fibromyalgia, and diabetes was used.)

For this study, health-related quality of life (HRQOL) was assessed, using a five-point rating scale of general health taken from a single question used on both the BRFSS and SF-12 study instruments. The five-point scale was clustered into two points: fair/poor versus good/very good/excellent, effectively dichotomizing responses.

Body mass index (BMI) was computed for each participant based on self-reported height and weight. BMI = (weight in kilograms)/(height in meters)^2.

Of the sixteen chronic health problems asked about, six were selected for analysis. These six items were high blood pressure, heart disease, osteoarthritis, depression, chronic back pain and diabetes. The conditions chosen for analysis were determined by high interest and prevalence in the family practice setting and low probability of misinterpretation.

Rheumatoid arthritis was not used because of the suspicion of its interpretation as "rheumatism." Osteoarthritis was chosen to represent joint pain/disease, and fibromyalgia was deleted because of probable misinterpretation. Liver disease and chronic shoulder pain had a low reported prevalence in this study and were not used in the analysis. Anemia/blood disease was believed to be misleading and omitted because of the confusion with "high blood" and "low blood" (terms used in this population to represent high blood pressure and anemia respectively).

The questionnaire used in this study allowed respondents to check multiple categories when asked to self identify their race/ethnicity. We omitted the few participants who did not check "black" only or "white" only from our analysis. There were 10 participants who checked both black and white. The numbers were too small for adequate analysis as a distinct group in this study.

Educational attainment is used as a proxy for socioeconomic status (SES). Educational attainment has been shown to be a reasonable and reliable surrogate

indicator of SES.[11] It was divided into three categories: less than a high school diploma, high school diploma and greater than a high school diploma, for these analyses.

Analysis:

Demographic information was stratified by African Americans and Whites, and the frequency of chronic conditions by age was calculated. Pearson chi-square analyses and 2-sample t-tests were used to detect significant differences between African Americans and Whites.

Odds ratios between African Americans and Whites were analyzed, using analysis of covariance, with health habits, risk factors, chronic conditions, and health related quality of life as factors, and age, gender and education level as covariates. All statistical tests were two sided (alpha=0.05).

Racially stratified age group analyses were used to determine the distribution and frequency of selected health indicators among the three age groups between African Americans and Whites.

Data from the SAS database were transformed into a Stata database and all statistical computations were performed using Stata 7.0 software.

Results

In the 15 practice sites, there were 7680 eligible participants, of which 4772 consented to participate, for a recruitment rate of 62%. Approximately 10% of participants were not able to complete the self-report questionnaire without support from the research assistants.

Demographics:

Among the respondents in the NC Health Project, 900 self-reported their race as "black" only, and 3481 reported their race as "white" only. The overall demographic information for our population, stratified by race, is reported in Table 1. Within our population, 76% of African Americans were female, and 70% of Whites were female. The mean ages (and standard deviations) were 47 (16.5) and 49 (16.9) for African Americans and Whites, respectively. Approximately half of the sample population of both African Americans and Whites were from a rural setting. A greater percentage of Whites had more than a high school education (53% compared to 39% for African Americans). Thirty percent of African Americans had less than a high school diploma, compared to 17% of Whites.

Marital status was determined using five categories (married, widowed, living w/ partner, separated/divorced, and never married). Sixty five percent of Whites, compared to 33% of African Americans, reported being married at the time of the survey. Reported working status revealed that 49% of African

Americans were currently working full time or part time, compared to 59% of Whites.

Health Risk Factors:

Health risk factors highlighted in this study were smoking status, exercise, body mass index (BMI), and high blood pressure. There was no significant difference in smoking status between African Americans and Whites, with approximately 36% of both groups currently smoking. There was a significant difference in the percentage of the population defined as obese (BMI >= 30). BMI was calculated from self-reported height and weight measurements; 53.4% of African Americans, compared to 35.5% of Whites, were classified as obese. Overall, 56% of African Americans and 42% of Whites reported getting no exercise on a typical day. A greater percentage of African Americans reported high blood pressure.

Odds ratios for the various risk factors and conditions among African Americans and Whites, adjusted for age, gender and education level, are found in Table 2. Significant odds ratios comparing African Americans and Whites were found in obesity, exercise, and high blood pressure. African Americans had a higher likelihood than Whites of reporting problems in these three areas.

The odds of being obese, for African Americans, were nearly twice as great as for Whites (OR 1.90; 95% confidence interval {CI} 1.61-2.25), adjusted for age, gender, and education level. African Americans also were more likely to have gotten no exercise in a typical day (OR 1.61; 95% CI 1.37-1.89) than Whites.

The odds of having high blood pressure for African Americans, compared to Whites, were 2.57 (95% CI 2.13-3.09), adjusted for age, gender, and education level. Significant differences also existed between African Americans and Whites in their odds of reporting that they smoked.

Chronic Diseases:

Of the self-reported chronic diseases analyzed in this study, the frequency of self-reporting diabetes was significantly greater among African Americans than Whites. There was no significant difference in percentages of self-reported heart disease, osteoarthritis, depression, or chronic back pain between African Americans and Whites.

African Americans had significantly greater odds of reporting diabetes than Whites, as seen in Table 2 (OR 2.18; 95% CI:1.76-2.70). Significant differences also existed between African Americans and Whites in their odds of reporting depression and chronic back pain.

Age comparisons:

The health indicators were analyzed in three age categories (< 40, 40-64, and >= 65) to compare frequencies between African Americans and Whites in our population (Table 3). The percentages in the table represent, for example, "Of those African Americans under the age of forty, what percentage report smoking now?"

African Americans reported insufficient exercise, obesity, high blood pressure, and diabetes with a significantly greater frequency than Whites in all age

groups. African Americans older than 64 years of age reported significantly more osteoarthritis than Whites. For all other health indicators analyzed, African American and White patients stratified by age, reported similar frequencies of health risk factors and chronic conditions.

Quality of Life:

About 37% of African Americans reported having fair/poor health compared to 24.3% of Whites. Significant odds ratios comparing African Americans and Whites were found in health-related quality of life (Table 2). African Americans had a higher likelihood than Whites of reporting fair/poor overall general health. The adjusted odds ratio of African Americans compared to Whites reporting poor or fair health was 1.55 (95% CI:1.29-1.86).

Among those subjects who reported having heart disease, high blood pressure, osteoarthritis, depression, and chronic back pain, African American subjects reported having decreased health related quality of life (fair/poor health) significantly more often than Whites with the same chronic condition. Among African American and White patients self-reporting the diagnosis of diabetes, the incidence of decreased health-related quality of life was not significantly different (65% and 57%, respectively, $p = 0.065$).

Discussion

This study corroborates previous evidence that there are racial disparities in chronic disease and health risk factors between African Americans and Whites, and it highlights specific factors that may be focused on in the family practice setting. Many risk behaviors associated with chronic disease are modifiable, and this data provides evidence that family practitioners should focus on culturally sensitive behavioral interventions and prevention techniques.

Health Behaviors and Chronic Diseases:

Our research documents racial disparities for several health risk factors and chronic diseases as well as health-related quality of life among the patients using the primary care practices surveyed. Among patients with access to family practice centers in North Carolina, there are significant differences between African American and White patients in their likelihood of reporting certain health risk factors, chronic conditions, and health-related quality of life measures. Obesity, insufficient exercise, high blood pressure, and diabetes were all found to be more likely to be reported by African Americans than Whites in our population. The odds of describing their health as fair or poor also were greater for African Americans than Whites in our population.

We compared our data to the North Carolina state-specific Behavioral Risk Factor Surveillance System (BRFSS) to assess differences between our population and the whole state. The BRFSS is a state-based telephone survey of

the civilian, non-institutionalized adult population that includes data on selected health-status indicators and health-risk behaviors.

Using North Carolina BRFSS 2000 Data[12] for comparison shows that a greater percentage of our population reported fair or poor general health than the state population overall. The state data in 2000, (total respondants: 2905) reported 23.3% of African Americans with fair/poor general health compared to 36.6% in our population. Statewide, 14.9% of Whites reported fair/poor health compared to 24.3% in our population. Our primary care population reported a lower smoking prevalence, higher obesity prevalence, higher diabetes prevalence, and similar osteoarthritis prevalence compared to the state population. Physical activity questions between the two studies were not similar enough for adequate comparison of this factor.

For all age groups, African Americans report more diabetes, increased obesity, high blood pressure, and inadequate exercise. In those under the age of 40, the percentage of African Americans reporting high blood pressure and diabetes is twice that of Whites. This data supports the argument that minorities develop disease at an earlier age. The causal factors should be examined further, and prevention, screening, and intervention programs for minorities should begin at a younger age.

Potential Causes of Health Disparities:

Previous literature has documented possible explanations for racial disparities in health, including SES, access, health-related behavior,

discrimination, and racism. The most important factor is differences in SES. In recent work that attempted to control for SES, the disparities were diminished, but they still existed. In this study educational status is used as a proxy for SES, and disparities persist (however this is an imperfect proxy).

Counseling For Health Behavior Change:

This survey provides further evidence that there are significant disparities in health risk factors and chronic conditions among racial and ethnic minorities. Identification of potentially modifiable risk factors that may contribute to excess disease risk suggests potential targets for prevention strategies. The findings of this study underscore the need for counseling patients about behavior changes in the primary care setting. The data suggest that there is opportunity for primary care physicians to have an impact on health disparities in racial minorities. There is some data describing behavior differences among blacks and whites that may be useful in tailoring behavior modification interventions in primary care.[13]

Many of the disparities documented in this study can be modified by lifestyle changes such as increased physical activity, nutrition, and smoking cessation. Patients look to their physicians for advice regarding preventive behavior, and the majority cite their physicians as their primary sources of information about health.[14] Behavior modification interventions can be of significant value in these patients, and literature has shown that primary care counseling is effective in altering patient behavior.

A meta analysis of primary care-based physical intervention studies revealed that physical activity counseling is effective, with stronger results obtained from interventions that were brief (3-10 minutes), tailored to the participants characteristics and preferences, and included supplemental written materials.[15] Furthermore, literature about smoking cessation demonstrates that physician intervention can change patient behavior.[16]

A survey of primary care patients by Finkelstein suggests that achieving a healthy weight (defined as BMI between 18.5-24.9 kg/m^2) will maximize a patient's subjective sense of well being.[17] The increased likelihood of obesity in African Americans in our population may partly explain the increased likelihood of their reporting a lower health-related quality of life.

In counseling patients for behavior change, especially those from minority communities, it is important to be aware of existing barriers to practicing good health behaviors and the importance of tailoring interventions to the individual patient. Physical activity intervention from primary care physicians was found to be effective in reaching a large segment of sedentary adults.[15] It is recommended that key strategies of physical activity counseling be integrated into routine practice.[15] Counseling should particularly target African Americans and other minorities because they are at a higher risk.

Limitations:

Several possible limitations of this study deserve mention. First, the data used for this analysis were all based on self-reported data, and there are inherent

biases in such data. In this study, educational status is used as a proxy for SES. We are aware that this is a limitation, as education is an imperfect proxy for SES, but there is reasonable evidence of a sufficiently strong relationship to control for the effects of SES.[11]

National data suggest that about 25% of all adults are completely sedentary (not physically active), and in blacks it is closer to 40%. Our percentage of "no exercise" responses may be higher than those reported for the general population because our question asks about "exercise," which may be interpreted as strenuous activity, rather than "physical activity."

Compared to the statewide BRFSS data, our survey population had an increased incidence of specific health indicators and poorer quality of life. However, one would expect to find higher rates of disease and health risk factors in those seeking care and utilizing physician services than in the general population.

It is well documented that there is a disparity in access to services between racial/ethnic groups. The patients in our sample all had access to care on the day that they completed the survey, but they may not have always had this access to care. Data on prior or future use of health services and barriers to care were not included in this study. Additionally, the quality of care, even with equal access may be different for African Americans and Whites. Even in groups with access to services, we continue to see disparities in health quality of life and chronic conditions. The goal of this study was to discover those conditions and the

possible social determinants of health that can be targeted for intervention and also be the focus of future research.

In summary, the self-reported prevalence of obesity, high blood pressure, insufficient exercise, diabetes, and poor health-related quality of life are significantly higher among African Americans than among Whites seeking care in North Carolina family practice clinics. This study documents that, compared to Whites, African Americans also have a tendency to develop these habits and conditions at a younger age. This investigation does not have the strength to determine cause and effect relationships, but rather to outline conditions and populations for further research. At this time further research is needed to investigate the root causes of the disparities noted in this study.

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Table 1: Selected characteristics of African-American and White Adult Family Practice Patients in North Carolina

	African-Amer. (N = 900) % or Mean (S.D.)	White (N = 3481) % or Mean (S.D.)	p-value*
Female gender	75.9%	69.5%	< 0.001
Age in years	47 (16.5)	49 (16.9)	0.0024
Rural	48.1%	53.2%	0.007
Education			< 0.001
Less than High School	29.6%	16.5%	
High School Diploma	31.7%	30.1%	
Beyond High School	38.7%	53.4%	
Marital Status			< 0.001
Married	32.7%	65.4%	
Widowed	12.1%	8.4%	
Living w/ partner	5.3%	2.7%	
Separated/Divorced	22.6%	13.4%	
Never Married	27.3%	10.3%	
Currently Working	49.2%	58.7%	< 0.001

Table 1 (cont'd): Selected characteristics of African-American and White Adult Family Practice Patients in North Carolina

Health Risk Factors			
Smoking now	36.3%	35.7%	0.785
No exercise	56.3%	41.6%	< 0.001
Obese (BMI >= 30)	53.4%	35.5%	< 0.001
High Blood Pressure	49.9%	32.8%	<0.001
Chronic Conditions			
Heart Disease	10.4%	12.1%	0.189
Osteoarthritis	26.4%	25.1%	0.439
Depression	25.8%	28.0%	0.209
Chronic Back Pain	25.8%	26.5%	0.663
Diabetes	22.7%	12.6%	<0.001
Health Related Quality of Life			
Fair/Poor Health	36.6%	24.3%	<0.001

*Significance tests for comparisons were calculated using Pearson's chi-square test for categorical variables and the 2-sample t-test for continuous variables

Table 2: Adjusted Odds Ratio of Selected Health Indicators Among African American Family Practice Patients Compared to Whites*

	Odds Ratio	95% CI
Health Risk Factors		
Smoke now	0.78	0.63-0.96
No exercise	1.61	1.37-1.89
Obese (BMI >= 30)	1.90	1.61-2.25
High Blood Pressure	2.57	2.13-3.09
Chronic Conditions		
Heart Disease	0.86	0.65-1.13
Osteoarthritis	1.12	0.91-1.38
Depression	0.75	0.62-0.91
Chronic Back Pain	0.83	0.69-1.00
Diabetes	2.18	1.76-2.70
Health Related Quality of Life		
Fair/Poor Health	1.55	1.29-1.86

* Odds ratios calculated using logistic regression with race as the explanatory variable and adjusted for subject age, gender and education.

Table 3: Age Group Frequency of Health Indicators Among African-American and White Adult Family Practice Patients

	African Amer.	White	p-value*
Smoke now			
Age < 40	40.9%	43.5%	0.529
Age 40-64	38.4%	38.4%	0.994
Age >=65	14.1%	13.2%	0.842
No exercise			
Age < 40	56.9%	39.4%	<0.001
Age 40-64	56.2%	42.2%	<0.001
Age >=65	54.4%	43.7%	0.029
Obese (BMI >= 30)			
Age < 40	50.6%	34.2%	<0.001
Age 40-64	57.2%	40.8%	<0.001
Age >=65	44.2%	24.5%	<0.001
High Blood Pressure			
Age < 40	23.0%	10.0%	<0.001
Age 40-64	62.7%	37.6%	<0.001
Age >=65	79.0%	59.7%	<0.001

Table 3 (cont'd): Age Group Frequency of Health Indicators Among African-American and White Adult Family Practice Patients

Heart Disease			
Age < 40	1.7%	1.2%	0.548
Age 40-64	9.9%	10.6%	0.701
Age >=65	36.4%	36.0%	0.935
Osteoarthritis			
Age < 40	5.7%	5.3%	0.754
Age 40-64	32.3%	28.7%	0.170
Age >=65	63.0%	52.3%	0.032
Depression			
Age < 40	22.3%	25.3%	0.281
Age 40-64	32.0%	32.1%	0.974
Age >=65	18.6%	23.3%	0.274
Chronic Back Pain			
Age < 40	16.2%	19.3%	0.233
Age 40-64	31.1%	29.0%	0.418
Age >=65	32.2%	34.1%	0.686

Table 3 (cont'd): Age Group Frequency of Health Indicators Among African-American and White Adult Family Practice Patients

Diabetes			
Age < 40	6.1%	3.2%	0.020
Age 40-64	32.3%	14.8%	<0.001
Age >=65	38.5%	23.5%	0.001

*Significance tests for comparisons were calculated using Pearson's chi-square test

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